## REMARKS

**Preliminary Remarks**

Reconsideration and allowance of the present application based on the foregoing amendment and following remarks are respectfully requested. Claims 8 and 10-27 have been canceled as being directed to a non-elected invention and not for any reason related to patentability. Claims 1-7 and 9 are currently pending in this application and remain at issue.

In paragraphs 1 and 2 of the official action, the examiner objected to the specification for (1) the presence of a blank space in page 33, and (2) lacking the Brief Description of the Drawings section. The applicants have inserted the language "Brief Description of the Drawing" after the "Summary of the Invention" on page 2, line 15 and deleted the description of the figures page 36, line 3 to page 38, line 2, all of the present specification. The spacing with respect to lines 12 and 32 on page 33 of the specification has been deleted. In view of the foregoing, withdrawal of the objections is respectfully requested.

In paragraph 6 of the official action, the draftsperson objected to the drawings pursuant to 37 C.F.R. §1.84. Specifically, the draftsperson noted that the numbers, letters, and reference characters in all the figures must be at least .32 cm in height. The applicants submit that corrected Figures 1-5 (submitted herewith) contain numbers, letters and references at least .32 cm in height as required by 37 C.F.R. §1.84. In view of the corrected drawings and foregoing remarks, the applicants submit the drawings are in proper form.

In paragraph 7 of the official action, the examiner objected to claim 1 for use of the phrase "[F]ermentation process..." as being unclear. The applicants have amended the phrase to "[A] fermentation process..." as suggested by the examiner. In view of the foregoing, the applicants request withdrawal of this objection to claim 1.

In paragraph 8 of the official action, the examiner objected to claims 2-7 and 9 for use of the phrase "[P]rocess according to claim" as being unclear. The examiner suggested amending this phrase to "[T]he process according to claim." The applicants have so amended claims 2-7 and 9 and therefore request withdrawal of this objection to claims 2-7 and 9.

In paragraph 9 of the official action, the examiner objected to claim 9 for being partially directed to the non-elected invention of claim 8. The applicants have amended

claim 9 to be directed to only the elected inventions of claims 1-7. In view of the foregoing, the applicants request withdrawal of this objection to claim 9.

The applicants do not intend by these or any amendments to abandon subject matter of the claims as originally filed or later presented, and reserve the right to pursue such subject matter in continuing applications.

**Patentability Remarks**

***Rejection Under 35 U.S.C. §112, Second Paragraph***

In paragraphs 10-19 of the official action, the examiner variously rejected claims 1-7 and 9 under 35 U.S.C. §112, second paragraph, for allegedly being indefinite. Specifically, the examiner alleged the following phrases in claim 1 were indefinite: "process for the preparation of L-amino acids, especially L-threonine," "in which microorganism at least the pckA gene or nucleotide sequence coding therefor are attenuated and, in particular switched off," "enrichment of the L-amino acid in the medium," "isolation of the L-amino acid, constituents of the fermentation broth and the biomass in its entirety or portions thereof optionally being isolate as a solid product together with the L-amino acid," and "pckA." The examiner further asserted that the term "pckA" and phrase "wherein the expression of the polynucleotide(s) coding for the pckA gene is attenuated and, in particular, switched off" were indefinite in claim 4. The examiner alleged the term "pckA" in claim 5 was indefinite as well. The examiner further stated the phrases "in particular, overexpressed," and "in particular, switched off" in claims 6 and 7 were unclear. The examiner further asserted that the phrase "fermentation of the microorgranisms of the family" in claim 1 and "polypeptide (enzyme protein) coded by the polynucleotide pckA" in claim 5 lacked antecedent basis. Finally, the examiner concluded by stating the phrase "genes selected from the group comprising" implies other genes in the group which are not recited in the claims exists but in reality do not exist.

Amended claim 1 is directed to a fermentation process for the preparation of a desired L-amino acid selected from the group consisting of L-threonine, L-isoleucine, L-valine, and L-lysine, wherein the following steps are carried out: (a) fermentation of an *E.coli* strain in a fermentation broth for producing the desired L-amino acid, wherein the endogenous gene encoding phosphoenolpyruvate (PEP) carboxykinase (*pck*A gene) of *E.coli* is attenuated; (b) concentration of the fermentation broth to eliminate water and increase the concentration said

L-amino acids in the broth and *E.coli*, and (c) isolation of the L-amino acid, constituents of the fermentation broth and the biomass. The applicants respectfully submit each amended phrase addresses the indefinite terms or phrases noted by the examiner. Support for amended claim 1 may be found throughout the specification as originally filed, *e.g.*, on page 2, lines 17-25; page 3, line 2; page 15, lines 4-8; Example 4; and Example 8.

Amended claim 4 is directed to a process according to claim 1, wherein the expression of the pckA gene is attenuated. The applicants have adopted the examiner's suggestion of the phrase "wherein the expression of the pckA gene is attenuated" thereby rendering the rejection of this claim moot.

Amended claim 5 is directed to a process according to claim 1, wherein the regulatory and/or catalytic properties of the polypeptide encoded by the pckA gene are reduced. The applicants have adopted the examiner's suggestion of the phrase "polypeptide encoded by the pckA gene," thereby rendering the rejection of this claim moot.

Amended claim 6 is now directed to a process according to claim 1, wherein one or more *E.coli* genes selected from the group consisting of the thrABC operon coding for aspartate kinase, homoserine dehydrogenase, homoserine kinase and threonine synthase, the pyc gene coding for pyruvate carboxylase, the pps gene coding for phosphoenolpyruvate synthase, the ppc gene coding for phosphoenolpyruvate carboxylase, the pntA and pntB genes codig for transhydrogenase, the rhtB gene for homoserine resistance, the rhtC gene for threonine resistance, and the gdhA gene coding for glutamate dehydrogenase are overexpressed during fermentation for the preparation of said L-amino acids.

Amended claim 7 is directed to a process according to claim 1, wherein one or more *E.coli* genes are selected from the group consisting of the tdh gene coding for threonine dehydrogenase, the mdh gen coding for malate dehydrogenase, the gene product of the open reading frame (orf) yjfA, and the gene product of the open reading frame (orf) ytfP, are attenuated or the expression is reduced during fermentation for the preparation of said L-amino acids. In view of the foregoing remarks and amendments, the applicants respectfully submit the rejection of claims 1-7 and 9 under 35 U.S.C. §112, second paragraph, for being indefinite has been overcome and should be withdrawn.

***Rejections Under 35 U.S.C. §112, First Paragraph***

*Written Description*

In paragraph 23 of the official action, the examiner rejected claims 1-7 and 9 under 35 U.S.C. §112, first paragraph, for allegedly failing to comply with the written description requirement. Specifically, the examiner alleged that while the specification discloses the structure of the *E. coli* pckA gene, there is no other disclosure of other PEP carboxykinase genes isolated from other microorganisms. Similarly, the examiner asserted that while the *E.coli* thrABC operon, pyc, pps, ppc, pntA, rhtB, rhtC, gdhA, tdh, mdh, yjfA, and ytfP genes are disclosed by the applicants, there is no disclosure in the specification of similar genes isolated from other microorganisms or critical structural elements to encode the proteins corresponding to the genes recited above. Furthermore, the examiner asserted the specification only discloses the production of L-threonine, L-isoleucine, L-valine, and L-lysine with an *E. coli* which comprises an inactivating deletion in the *E. coli* pckA gene and other genes of *E.coli*, the specification fails to disclose other genes isolated from other organisms which are part of other biosynthetic pathways as recited in the claims that can be amplified or reduced but result in an increase production of L-amino acids.

As discussed above, claim 1 has been amended to be directed to a fermentation process for the preparation of a desired L-amino acid selected from the group consisting of L-threonine, L-isoleucine, L-valine, and L-lysine, wherein the following steps are carried out: (a) fermentation of an *E.coli* strain in a fermentation broth for producing the desired L-amino acid, wherein the endogenous gene encoding phosphoenolpyruvate (PEP) carboxykinase (*pck*A gene) of *E.coli* is attenuated; (b) concentration of the fermentation broth to eliminate water and increase the concentration said L-amino acids in the broth and *E.coli*, and (c) isolation of the L-amino acid, constituents of the fermentation broth and the biomass, all of which has been previously acknowledged by the examiner as sufficiently described in the specification.

As discussed above, amended claim 6 is now directed to the process according to claim 1, wherein one or more *E.coli* genes selected from the group consisting of pyc, pps, ppc, pntA, pntB, rhtB, rhtC, and gdhA are overexpressed during fermentation for the preparation of said L-amino acids. The list of *E.coli* genes has been previously acknowledged by the examiner to be well described in the specification.

Finally, amended claim 7 is now directed to the process according to claim 1, wherein one or more *E. coli* genes selected from the group consisting of the tdh gene, mdh gene, yjfA gene and the ytfP gene are attenuated or the expression is reduced during fermentation for the preparation of said L-amino acids. The list of *E.coli* gene in claim 7 is also acknowledged by the examiner to be well described in the specification.

Amended claims 2-5 and 9 are directed to particular genetic components of the *E.coli* microorganisms. For example, amended claim 2 is now directed to the process according to claim 1, wherein other genes of the biosynthetic pathway of the desired L-amino acid of E. coli are additionally amplified. Amended claim 3 is now directed to the process according to claim 1, wherein the metabolic pathways which reduce the formation of the desired L-amino acid of E. coli are at least partially switched off. Support for amended claims 2 and 3 can be found throughout the specification, for example, Examples 5-10. As discussed above, dependent claims 4 and 5 are directed to the process according to claim 1, wherein the biological properties of the attenuated pckA gene expression are further claimed. Claim 9 is directed to process according to claims 1-7 wherein L-isoleucine, L-valine, L-lysine, or L-threonine is prepared. Support for amended claims 4, 5, and 9 can be found throughout the specification, for example, originally filed claims 4, 5, and 9.

In view of the foregoing amendments and remarks, the applicants submit that the rejection of claims 1-7 and 9 pursuant to 35 U.S.C. §112, first paragraph, for lack of written description, has been overcome and should be withdrawn.

*Enablement*

In paragraph 24 of the official action, the examiner rejected claims 1-7 and 9 under 35 U.S.C. §112, first paragraph, for allegedly being broader than the enabling disclosure. Specifically, the examiner alleged that while the specification enables one of skill in the art to isolate the structure of *E. coli* pckA gene, there is no other disclosure of other PEP carboxykinase genes isolated from other microorganisms. Similarly, the examiner asserted that while the *E.coli* thrABC operon, pyc, pps, ppc, pntA, rhtB, rhtC, gdhA, tdh, mdh, yjfA, and ytfP genes are enabled by the applicants specification, there is no disclosure in the specification of similar genes isolated from other microorganisms or critical structural elements to encode the proteins corresponding to the genes recited above. Furthermore, the examiner asserted the specification only enables for the production of L-threonine, L-

isoleucine, L-valine, and L-lysine with an *E. coli* which comprises an inactivating deletion in the *E. coli* pckA gene and other genes of *E.coli*, the specification fails to disclose other genes isolated from other organisms which are part of other biosynthetic pathways as recited in the claims that can be amplified or reduced but result in an increase production of L-amino acids.

As discussed above, claims 1-7 and 9 have been amended to be directed to the claimed process of claim 1 wherein (1) the *E.coli* PEP carboxykinase gene is attenuated; (2) the attenuated PEP carboxylase *E. coli* cell can also harbor amplified *E. coli* genes (*i.e.*, thrABC operon, pyc, pps, ppc, pntA, rhtB, rhtC, or gdhA) that are associated with biosynthetic or metabolic pathways of the desired L-amino acid; and/or (3) the attenuated PEP carboxylase *E. coli* cell can also harbor attenuated *E.coli* genes (or *E.coli* genes whose expression is greatly reduced) (*i.e.*, tdh, mdh, yjfA, or ytfP) as well. As acknowledged by the examiner, the specification fully enables one of skill in the art to practice the claimed process to produce the L-amino acids L-isoleucine, L-threonine, L-valine, and L-lysine. In addition, the examiner acknowledged the enabled disclosure of using the attenuated *E. coli* gene pckA in combination with the thrABC operon, pyc, pps, ppc, pntA, pntB, rhtB, rhtC or gdhA full length *E. coli* genes and the tdh, mdh, yjfA, or ytfP attenuated *E. coli* genes.

In view of the foregoing amendments and remarks, the applicants respectfully submit that the rejection of claims 1-7 and 9 pursuant to 35 U.S.C. §112, first paragraph, for lack of enablement has been overcome and should be withdrawn.

***Rejection Under 35 U.S.C. §103(a)***

***Eikmanns in view of Medina, Goldie, and Applicants Admission***

In paragraph 27 of the official action, the examiner rejected claims 1, 4, 5, and 9 under 35 U.S.C. §103(a) as allegedly being obvious over Eikmanns *et al.*, U.S. Patent Number 6,420,151 (hereafter Eikmanns) in view of Medina *et al., J. Bacteriol.* 172:7151-7156 (1990) (hereafter Medina), Goldie *et al., J. Bacteriol.* 141:1115-1121 (1980) (hereafter Goldie), and applicants' admission that *E. coli* is a well known microorganism for the production of amino acids (page 1, lines 11-15 of the specification hereafter "applicants passage"). Specifically, the examiner alleged it would have been obvious to one of ordinary skill in the art at the time the invention was to create a mutant *E. coli* comprising an inactivating deletion in the *pck*A gene using the nucleotide sequence disclosed by Medina *et al.* for the production of L-lysine or L-threonine, or use the mutant *E. coli* of Goldie *et al.* for

the production of L-lysine or L-threonine as taught by Eikmanns. The examiner further alleged a person of ordinary skill in the art is motivated to create such *E. coli* mutant for the production of L-lysine or L-threonine, or to use the *E. coli* mutant of Goldie *et al.* for the benefit of producing these amino acids since, as allegedly admitted by the applicants on page 1, lines 11-15, *E. coli* is a well known microorganism for the production of amino acids. Furthermore, the examiner asserted one of ordinary skill in the art has a reasonable expectation of success at creating an *E. coli* mutant with an inactivating deletion in the pckA gene and use it L-lysine or L-threonine production since Medina teach the pckA gene structure and Eikmanns teach the production of L-lysine and L-threonine with a C. glutamicum cell comprising an inactivating deletion in the pckA gene. Finally, the examiner alleged one of skill in the art has a reasonable expectation of success at using the *E.coli* mutant of Goldie for L-lysine or L-threonine production since Eikmanns teach the production of L-lysine and L-threonine with a *C.glutamicum* cell comprising an inactivating deletion in the pckA gene.

With regard to the primary reference, the applicants respectfully submit that Eikmanns is not available for use as prior art in a rejection based upon 35 U.S.C. §103(a) in view of the 35 U.S.C. §103(c). Specifically, the applicants note that at the time the presently claimed invention was made, it and the invention of Eikmanns were owned by the same assignee (Degussa AG) or subject to an agreement (inventors are employees of Degussa AG) to assign to the same assignee (Degussa AG).

In support of this position that applicants have enclosed a copy of the "Notice of Recordation of Assignment Document" (see Appendix A), which indicates that the inventors of the Eikmanns invention originally assigned their rights to Degussa-Huls AG. The invention of Eikmanns was then reassigned by Degussa-Huls AG to Degussa AG (due to a name change/merger; see Appendix B). Enclosed herewith as Appendix C, is a copy of a "Notice of Recordation of Assignment Document" which indicates that the presently claimed invention was assigned to Degussa AG. Therefore, in view of the foregoing and the fact that Eikmanns could only qualify as prior art under one or more subsections of (e), (f), and (g) of 35 U.S.C. §102, the applicants submit that the cited U.S. patent cannot quality for use a prior art in a rejection based upon 35 U.S.C. §103(c).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the

knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references (or reference when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicants' disclosure. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991).

The examiner bears the burden of establishing a prima facie case of obviousness and "can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." *In re Fine*, 5 U.S.P.Q.2d 1598 (Fed. Cir. 1988). To support a conclusion that a claimed composition is obvious, either: (a) the references must expressly or impliedly suggest the claimed composition to one of ordinary skill in the art, or (b) the examiner must present a convincing line of reasoning as to why a person of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q.972, 973 (Bd. Pat. App. & Inter. 1985).

The applicants submit that the secondary references neither teach or suggest the claimed invention alone. More particularly, none of these cited documents teach or suggest the production of L-lysine, L-threonine, L-isoleucine, and L-valine by fermenting *E.coli* in a fermentation broth wherein the endogenous gene encoding phosphoenolpyruvate (PEP) carboxykinase (pckA gene) of *E.coli* is attenuated or reduced. While Medina simply teaches the full length sequence of the pckA gene but does not teach or suggest attenuating the pckA gene for L-lysine, L-threonine, L-isoleucine, or L-valine production. Goldie specifically teaches a mutant *E. coli* deficient in PEP activity but does nothing to teach or suggest its utility for fermenting and isolating for the L-amino acids L-lysine, L-threonine, L-isoleucine, or L-valine in *E.coli.* The applicants discussion on page 1 simply teaches L-amino acids can be produced by the fermentation of strains of Enterobacteriaceae but does not teach or suggest any specific genetic improvements like pckA gene knockouts to improve the preparation process. Accordingly, the applicants respectfully submit that one of skill in the art would not be directed to development of a process for the preparation of a desired L-amino acid selected from the group consisting of L-threonine, L-isoleucine, L-valine, and L-lysine, wherein the following steps of (a) fermentation of an *E. coli* strain in a fermentation

broth for producing the desired L-amino acid wherein the endogenous gene encoding phosphoenolpyruvate (PEP) carboxykinase (pckA gene) of *E. coli* is attenuated, (b) concentration of the fermentation broth to eliminate water and increase the concentration of said L-amino acids in the broth and *E.coli*, and (c) isolation of the L-amino acid constituents of the fermentation broth and the biomass (claim 1) in view of Medina, Goldie, or the applicants' passage either alone or in combination.

In summary, the applicants submit Eikmanns is not a proper 103(a) reference due to 35 U.S.C. §103(c) and the secondary references, either alone or in combination neither teach nor suggest the applicants claimed invention. Accordingly, without such teaching or suggestion, the examiner has not established a *prima facie* case of obviousness. Therefore, withdrawal of the rejection at paragraph 27 based upon 35 U.S.C. §103(a) is respectfully requested.

***Eikmanns in view of Medina, Goldie, Applicants Admission, and Katinka***

In paragraph 28 of the official action, the examiner rejected claims 2 and 6 under 35 U.S.C. §103(a) as being obvious over Eikmanns in view of Medina, Goldie, the applicants' admission, and Katinka *et al., Proc. Natl. Acad. Sci.* 77:5730-5733 (1980) (hereafter Katinka). Specifically, the examiner alleged in addition to her comments in paragraph 28 of the official action, Eikmanns further teaches that it is advantageous to overexpress one or more enzymes of the particular biosynthesis route (*i.e., C. glutamicum dap*A gene for L-lysine production and homoserine dehydrogenase for L-threonine production) in addition to the attenuation of the PEP carboxykinase gene. The examiner further alleged Katinka teaches the nucleotide sequence of the E. coli thrA gene. The examiner concluded by stating one of ordinary in the art has a reasonable expectation of success at creating an *E. coli* mutant with an inactivating deletion in the *pck*A gene and capable of overexpressing the *E. coli thr*A gene for L-lysine or L-threonine production since Medina teaches the *pck*A gene structure, Katinka teaches the *E. coli thr* A gene structure, overexpression of *E. coli* genes in well known in the art, and Eikmanns teach the production of L-lysine and L-threonine in *C. glutamicum* cells comprising an inactivated *pck*A gene.

As stated above, Eikmanns, the primary document, is not available as prior art for use in an obviousness rejection based upon 35 U.S.C. §103(c). The applicants submit that these secondary references neither teach nor suggest the claimed invention either alone or in

combination. Specifically, none of these references teach or suggest, *E. coli* in a fermentation broth used for the production of L-amino acids like L-threonine, L-isoleucine, L-valine and L-leucine wherein the endogenous *pck*A gene is attenuated or reduced with other genes, such as the *thr*ABC operon are amplified. In addition to the comments regarding Medina, Goldie, and the applicants' passage above, Katinka does not teach or suggest the claimed invention as well. Specifically, Katinka only teaches the nucleotide sequence of the *E. coli* thrA gene and does not suggest or teach using this in combination with a *pck*A gene for purposes of increasing L-amino acid production. Accordingly, the applicants respectfully submit one of skill in the art would not be directed to the development of a process for the preparation of a desired L-amino acid selected from the group consisting of L-threonine, L-isoleucine, L-valine, and L-lysine, wherein the following steps of claim 1 wherein other genes such as *thr*A of the biosynthetic pathway of the desired L-amino acid of *E.coli* are additionally amplified.

In summary, the applicants submit that Eikmanns is not available as prior art for use in a rejection based upon 35 U.S.C. §103(c) and further submit Medina, Goldi, the applicants' passage, and Katinka alone or in combination neither teach nor suggest the applicants claimed invention. Accordingly, without such teaching or suggestion, the examiner has not established a *prima facie* case of obviousness. Therefore, withdrawal of the rejection under paragraph 28 based upon 35 U.S.C. §103(a) is respectfully requested.

***Rejection Under Nonstatutory Double Patenting***

In paragraphs 30-33 of the official action, the examiner rejected claims 1, 3, 4, and 5 under the judicially created doctrine of obviousness-type double patent as being unpatentable over claims 9 and 10 of co-pending application no. 10/076416, claims 12-14 of co-pending application no. 10/114043, claims 12-14 of co-pending application no. 10/114048, and claims 12-14 of co-pending application no. 10/114073. Specifically, the examiner alleged each of the conflicting claims (*i.e.*, claims 1, 3, 4, and 5 vs. for example claims 9 and 10 of co-pending application no. 10/076416) are directed to a fermentation process for the production of an L-amino acid which uses an Enterobacteriaceae modified such that is contains a PEP carboxykinase gene wherein the expression of said gene has been reduced or eliminated and wherein said microorganism further comprises a modification (attenuated dgsA, aceA, pox B or fruR gene) such that the metabolic pathways will no longer reduce the formation of the desired L-amino acid. In view of the foregoing amendments and remarks, the applicants traverse this rejection.

The applicants submit the rejection of claims 1, 4, and 5 is no longer applicable in view of the foregoing amendments. Specifically, each of these claims are directed to a fermentation process for the preparation of L-threonine, L-isoleucine, L-valine or L-lysine by fermenting an *E.coli* strain with an attenuated pckA gene or pckA gene wherein its expression is reduced. Claims 12-14 of co-pending application no. 10/114043, claim 9 and 10 of co-pending application no. 10/076416, claims 12-14 of co-pending application no. 10/114048, and claims 12-14 of co-pending application no. 10/114073 are each directed to a fermentation process for the production of L-amino acids which uses an Enterobacteriaceae modified such that it contains either a modified dgsA, pox B, aceA, or fruR gene in combination with an attenuated or mutated pckA gene. Claims 1, 4, and 5 do not recite such a combination with the attenuated pckA gene. Accordingly, claims 1, 4, and 5 are patentably distinct and cannot possibly be either anticipated or considered obvious in view of the disclosures of U.S. Patent Application Nos. 10/076416, 10/114043, 10/114048, and 10/114073.

In order to expedite prosecution and without prejudice to the applicants' right to seek broader claims in a continuing application, claim 3 has been canceled without prejudice thereby obviating the provisional rejection of this claim. In view of the foregoing amendments and remarks, the applicants respectfully submit that the rejection of claims 1 and 3-5 under the judicially created doctrine of obviousness-type double patenting, has been overcome and should be withdrawn.

## CONCLUSION

In view of the foregoing, the claims are now believed to be in form for allowance, and such action such action is hereby solicited. If any point remains in issue which the examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,
PILLSBURY WINTHROP LLP

By: _____
THOMAS A. CAWLEY, JR., Ph.D.
Reg. No. 40944
Tel. No. (703) 905-2144
Fax No. (703) 905-2500

TAC/PAJ
P.O. Box 10500
McLean, VA 22102
(703) 905-2000

A

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PILLSBURY MADISON & SUTRO LLP
ANN S. HOBBS
1100 NEW YORK AVENUE, NW, NINTH FLOOR
WASHINGTON, D.C. 20005-3918



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BRIEF: ASSIGNMENT OF ASSIGNOR''S INTEREST (SEE DOCUMENT FOR DETAILS).

ASSIGNOR:
EIKMANNS, BERNARD

DOC DATE: 01/10/2000

ASSIGNOR:
RIEDEL, CHRISTIAN

DOC DATE: 01/10/2000

ASSIGNOR:
SAHM, HERMANN

DOC DATE: 01/17/2000

ASSIGNOR:
MOCKEL, BETTINA

DOC DATE: 01/06/2000

ASSIGNEE:
DEGUSSA-HULS AG
PATENTE UND MARKEN
POSTFACH 1345, DE 63403, HANAU

FED REP GERMANY

SERIAL NUMBER: 09455777
PATENT NUMBER:

FILING DATE: 12/07/1999
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ALLYSON PURNELL, EXAMINER
ASSIGNMENT DIVISION
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Chief Financial Officer and Chief Administrative Officer
Washington, DC 20231
www.uspto.gov

SMITH, GAMBRELL & RUSSELL, LLP
ROBERT G. WEILACHER
1850 M ST., N.W. (SUITE 800)
WASHINGTON, D.C. 20036

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DEGUSSA-HULS AKTIENGESELLSCHAFT

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ASSIGNEE:
DEGUSSA AG
BENNIGSENPLATZ 1
DE-40474 DUSSELDORF, FED REP
GERMANY

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| SERIAL NUMBER: 60140449<br>PATENT NUMBER: | 990092 ✓ | FILING DATE: 06/23/1999<br>ISSUE DATE: |
| SERIAL NUMBER: 09692515<br>PATENT NUMBER: | 990099 ✓ | FILING DATE: 10/20/2000<br>ISSUE DATE: |
| SERIAL NUMBER: 09715096<br>PATENT NUMBER: | 990106 ✓ | FILING DATE: 11/20/2000<br>ISSUE DATE: |
| SERIAL NUMBER: 60142915<br>PATENT NUMBER: | 990107 ✓ | FILING DATE: 07/09/1999<br>ISSUE DATE: |
| SERIAL NUMBER: 09607952<br>PATENT NUMBER: | 990108 ✓ | FILING DATE: 06/30/2000<br>ISSUE DATE: |
| SERIAL NUMBER: 60142044<br>PATENT NUMBER: | 990108 ✓ | FILING DATE: 07/02/1999<br>ISSUE DATE: |
| SERIAL NUMBER: 09456304<br>PATENT NUMBER: | 990109 ✓ | FILING DATE: 12/08/1999<br>ISSUE DATE: |
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| SERIAL NUMBER: 09764140<br>PATENT NUMBER: 6323349 | 990121 ✓ | FILING DATE: 01/19/2001<br>ISSUE DATE: 11/27/2001 |
| SERIAL NUMBER: 09427548<br>PATENT NUMBER: | 990126 ✓ | FILING DATE: 10/27/1999<br>ISSUE DATE: |
| SERIAL NUMBER: 09685933<br>PATENT NUMBER: | 990127 ✓ | FILING DATE: 10/11/2000<br>ISSUE DATE: |
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PILLSBURY WINTHROP LLP
MICHAEL A. SANZO
1600 TYSONS BOULEVARD
INTELLECTUAL PROPERTY GROUP
MCLEAN, VA 22102

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ASSIGNOR:
RIEPING, MECHTHILD

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ASSIGNOR:
BASTUCK, CHRISTINE

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ASSIGNOR:
HERMANN, THOMAS

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ASSIGNOR:
THIERBACH, GEORG

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ASSIGNEE:
DEGUSSSA AG
BENNIGSENPLATZ 1
DE-40474 DUSSELDORF, FED REP
GERMANY

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